

## WHAT IS CLAIMED IS:

1. A brake shoe assembly comprising:  
a brake shoe having an outer radial surface;  
a brake plate secured to the outer radial surface of the brake shoe, the  
5 brake plate having a backing plate that supports a brake lining;  
at least one slot formed on the backing plate and at least one key  
provided on the brake shoe for resisting radial movement of the brake plate relative  
to the outer radial surface of the brake shoe; and  
a plurality of fasteners for securing the brake plate to the brake shoe,  
10 the plurality of fasteners including a preassembled fastener preassembled to the brake  
plate and extending away from the brake plate toward the brake shoe;  
wherein the brake shoe having holes for receiving the plurality of  
fasteners, the preassembled fastener being inserted into a corresponding one of the  
holes to facilitate alignment of the at least one key within the at least one slot.
- 1 2. The brake shoe assembly of claim 1 wherein the plurality of  
2 fasteners are rivets.
- 1 3. The brake shoe assembly of claim 1 wherein the plurality of  
2 fasteners are threaded clinch stud bolts.
- 1 4. The brake shoe assembly of claim 1 wherein the preassembled  
2 fastener is longer than the at least one key to facilitate aligning the at least one key  
3 relative to the at least one slot prior to the at least one slot receiving the at least one  
4 key.
- 1 5. The brake shoe assembly of claim 1 wherein the preassembled  
2 fastener is secured to the brake shoe by a flaring tool.
- 1 6. The brake shoe assembly of claim 1 further comprising a  
2 friction material brake lining molded over and covering a portion of the preassembled  
3 fastener.

1                   7.     A brake shoe assembly comprising:  
2                   a brake shoe having an outer radial surface;  
3                   a brake plate secured to the outer radial surface of the brake shoe, the  
4 brake plate having a backing plate that supports a brake lining;  
5                   at least one slot formed on the brake shoe, at least one key provided on  
6 the backing plate that receives the at least one key provided on the backing plate for  
7 resisting radial movement of the brake plate relative to the outer radial surface of the  
8 brake shoe; and  
9                   a plurality of fasteners for securing the brake plate to the brake shoe;  
10                  and  
11                   a frictional brake lining molded on the brake plate, the brake lining  
12 having cut out portions exposing four corners of the brake plate, wherein each exposed  
13 corner of the brake plate has a hole for receiving one of the fasteners for fastening the  
14 brake plate to the brake shoe.

1                   8.     The brake shoe assembly of claim 7 wherein the slot is axially  
2 elongated to receive a correspondingly elongated key.

1                   9.     The brake shoe assembly of claim 8 wherein the at least one slot  
2 formed on the brake shoe includes a pair of axially elongated slots for receiving the  
3 at least one key on the backing plate that includes a corresponding pair of axially  
4 elongated keys formed on the backing plate.

1                   10.    The brake shoe assembly of claim 7 wherein the at least one key  
2 is integrally formed as part of the backing plate.

1                   11.    The brake shoe assembly of claim 7 wherein the at least one slot  
2 extends circumferentially around part of the brake shoe.

1                   12.    The brake shoe assembly of claim 11 wherein the at least one  
2 slot formed on the brake shoe includes a pair of circumferentially extending slots for

3 receiving a pair of the keys on the backing plate that correspond in size to the  
4 circumferentially extending slots.

1 13. A brake shoe assembly comprising:  
2 a brake shoe having an outer radial surface;  
3 a brake plate secured to the outer radial surface of the brake shoe, the  
4 brake plate having a backing plate that supports a brake lining, the backing plate  
5 having at least one slot;  
6 at least one key provided on the brake shoe that is received by the at  
7 least one slot for resisting radial movement of the brake plate relative to the outer  
8 radial surface of the brake shoe;  
9 a plurality of fasteners for securing the brake plate to the brake shoe;  
10 and  
11 a frictional brake lining molded on the brake plate, the frictional  
12 brake lining having cut out portions exposing four corners of the brake plate,  
13 wherein each exposed corner of the brake plate has a hole for receiving one of the  
14 fasteners for fastening the brake plate to the brake shoe.

1 14. The brake shoe assembly of claim 13 wherein the at least one  
2 slot is axially elongated to receive a correspondingly elongated key.

1 15. The brake shoe assembly of claim 14 wherein the brake plate  
2 includes a pair of axially elongated slots for receiving a corresponding pair of  
3 axially elongated keys formed on the brake shoe.

1 16. The brake shoe assembly of claim 13 wherein the at least one  
2 key is integrally formed as part of the brake shoe.

1 17. A method for manufacturing a brake assembly, the method  
2 comprising:  
3 providing a brake plate having a plurality of fastener apertures and  
4 an alignment slot, wherein the plurality of fastener apertures includes corner fastener

5 apertures provided at four corners of the brake plate and two intermediate fastener  
6 apertures provided on opposite sides of the brake plate;  
7 inserting a set of preassembled fasteners into the two intermediate  
8 fastener apertures of the brake plate;  
9 molding a friction material brake lining over the set of preassembled  
10 fasteners, the friction material brake lining covering the set of preassembled  
11 fasteners;  
12 providing a brake shoe having a plurality of holes corresponding to  
13 the location of the plurality of fastener apertures of the brake plate, the brake shoe  
14 further including a key protruding from an outer radial surface;  
15 mating the alignment slot with the key by aligning the preassembled  
16 fasteners with corresponding holes in the brake shoe prior to the alignment slot  
17 receiving the key;  
18 inserting a fastener in each of the corner fastener apertures, the  
19 fasteners extending through corresponding holes in the brake shoe and fastener  
20 apertures in the brake plate; and  
21 securing the brake plate by fastening the fasteners and the  
22 preassembled fasteners to the brake shoe with the slot receiving the alignment key  
23 to resist radial movement of the brake plate relative to the outer radial surface of the  
24 brake shoe.

1 18. The method of claim 17 wherein the molding step comprises  
2 molding the friction material brake lining on the brake plate while preventing  
3 application of the friction material brake lining over portions of the four corners of  
4 the brake plate, wherein each corner of the brake plate includes one of the corner  
5 fastener apertures.

1 19. The method of claim 17 wherein providing the brake plate  
2 comprises forming the alignment slot as an axially elongated aperture and forming  
3 the key as an axially elongated rib to fit within the axially elongated aperture.

1                   20.     The method of claim 19 further comprising forming a pair of  
2 axially elongated slots in the brake plate and forming a corresponding pair of axially  
3 elongated keys in the brake shoe.

1                   21.     The method of claim 17 wherein providing the brake shoe  
2 comprises forming the key as an integrally formed portion of the brake shoe.

1                   22.     A method for manufacturing a brake assembly, the method  
2 comprising:  
3                   providing a brake plate having a plurality of fastener apertures and a  
4 protrusion, wherein four of the fastener apertures are corner fastener apertures  
5 provided at four corners of the brake plate and two of the fastener apertures are  
6 intermediate fastener apertures provided on opposite sides of the brake plate;  
7                   inserting a set of preassembled fasteners into the two intermediate  
8 fastener apertures of the brake plate;  
9                   molding a friction material brake lining onto the brake plate over the  
10 set of preassembled fasteners, the friction material brake lining covering a portion of  
11 each member of the set of preassembled fasteners;  
12                  providing a brake shoe having a plurality of holes corresponding to the  
13 location of the plurality of fastener apertures of the brake plate, the brake shoe further  
14 including an opening in an outer radial surface;  
15                  mating the protrusion with the opening by aligning each member of the  
16 set of preassembled fasteners with corresponding holes in the brake shoe prior to  
17 inserting the protrusion into the opening;  
18                  inserting a fastener in each of the corner fastener apertures with each  
19 fastener extending through a corresponding hole in the brake shoe and a fastener  
20 aperture in the brake plate; and  
21                  securing the brake plate by fastening the fasteners and the  
22 preassembled fasteners to the brake shoe with the protrusion being inserted into the  
23 opening to resist radial movement of the brake plate relative to the outer radial surface  
24 of the brake shoe.

1                   23.     The method of claim 22 wherein the molding step comprises  
2     molding the friction material brake lining on the brake plate while preventing  
3     application of the friction material brake lining over portions of the four corners of the  
4     brake plate, wherein each corner of the brake plate includes one of the corner fastener  
5     apertures.

1                   24.     The method of claim 22 wherein providing the brake plate  
2     comprises forming the protrusion as an axially elongated aperture and forming the  
3     opening as an axially elongated rib to fit within the axially elongated aperture.

1                   25.     The method of claim 22 further comprising forming a pair of  
2     axially elongated protrusions in the brake plate and forming a corresponding pair of  
3     axially elongated openings in the brake shoe.

1                   26.     The method of claim 22 wherein providing the brake shoe  
2     comprises forming the opening as an integrally formed portion of the brake shoe.

1                   27.     A drum brake shoe assembly for a vehicle, comprising:  
2                   a cylindrical brake shoe having an outer radial surface;  
3                   a brake plate secured to the outer radial surface of the brake shoe;  
4                   a frictional brake lining molded over the brake plate and covering a  
5     preassembled fastener;  
6                   a key and a slot for receiving the key for resisting radial movement of  
7     the brake plate relative to the outer radial surface; and  
8                   wherein the preassembled fastener is secured to and extends away from  
9     the brake plate toward the brake shoe, the brake shoe having a hole for receiving the  
10    preassembled fastener, the preassembled fastener being inserted into the hole prior to  
11    mating the slot with the key to facilitate alignment of the key with the slot.

1                   28.     The drum brake shoe assembly of claim 27 wherein the slot is  
2     axially elongated to receive a correspondingly elongated key.

1                    29.     The drum brake shoe assembly of claim 27 wherein the slot is  
2     circumferential to receive a correspondingly circumferential key.

1                    30.     A brake shoe assembly comprising:  
2                    a brake shoe having an outer radial surface;  
3                    a brake plate secured to the outer radial surface of the brake shoe, the  
4     brake plate having a backing plate that supports a brake lining;  
5                    a tang provided on the backing plate and at least one receptacle  
6     provided on the brake shoe that receives the tang for resisting radial movement of the  
7     brake plate relative to the outer radial surface of the brake shoe;  
8                    a plurality of fasteners for securing the brake plate to the brake shoe;  
9     and  
10                   a fastener preassembled to the brake plate and extending away from the  
11     brake plate toward the brake shoe, the brake shoe having a hole for receiving the  
12     fastener, the fastener being inserted into the hole to facilitate alignment of the tang  
13     within the receptacle.

1                    31.     A brake shoe assembly comprising:  
2                    a brake shoe having an outer radial surface;  
3                    a brake plate secured to the outer radial surface of the brake shoe, the  
4     brake plate having a backing plate that supports a brake lining;  
5                    at least one cylindrical key hole formed on the brake shoe and at least  
6     one cylindrical key provided on the backing plate for resisting radial movement of the  
7     brake plate relative to the outer radial surface of the brake shoe;  
8                    a plurality of fasteners for securing the brake plate to the brake shoe;  
9     and  
10                   a fastener being preassembled to the brake plate and extending away  
11     from the brake plate toward the brake shoe, the brake shoe having a hole for receiving  
12     the fastener, the fastener being inserted into the hole to facilitate alignment of the at  
13     least one cylindrical key within the cylindrical key hole.

1                    32.     The brake shoe assembly of claim 1 wherein the plurality  
2     fasteners are rivets.

1                    33.    The brake shoe assembly of claim 31 wherein the plurality of  
2 fasteners are threaded clinch stud bolts.

1                    34.    The brake shoe assembly of claim 31 wherein the fastener is  
2 longer than the at least one cylindrical key to facilitate aligning the at least one  
3 cylindrical key relative to the cylindrical key hole prior to the slot receiving the at  
4 least one cylindrical key.

1                    35.    The brake shoe assembly of claim 31 further comprising a  
friction material brake lining molded over and covering a portion of the fastener.

                    36.    A brake shoe assembly comprising;  
                    a brake shoe having an outer surface that includes a plurality of flats;  
5                    a plurality of brake plates each of which are assembled to one of the  
flats, each of the brake plates having a flat backing plate and a layer of friction  
material applied to the opposite side of the backing plate relative to the brake shoe,  
the layer of friction material having a partially cylindrical outer surface that is  
adapted to engage a brake drum; and  
10                   a plurality of fasteners securing the brake plates to the brake shoe.

                    37.    The brake shoe assembly of claim 36, wherein one of the  
brake shoe and backing plates have a key and the other of the brake shoe and  
backing plates have a key way that is formed and located to receive the key, wherein  
the key and key way supplement the fasteners in securing the brake plates to the  
15 brake shoe and particularly resist shear forces between the brake plates and brake  
shoe.

                    38.    The brake shoe assembly of claim 37 wherein the key is  
formed on the brake shoe to extend in an axial direction and radially toward one of  
the brake plates and is received in the key way formed in the brake plate and that  
20 extends in an axial direction.



39. The brake shoe assembly of claim 37 wherein the key is formed on each one of the brake plate to extend radially toward the brake shoe and is received in the key way formed in the brake shoe.

- 5 40. The brake shoe assembly of claim 39 wherein the key is formed by a portion of the backing plate partially punched through the backing plate and the key way is a hole formed in the brake shoe at a location corresponding to the location of the key in the brake plate.